

CLAIMS

[1] A liquid crystal display device comprising:

a liquid crystal display panel, wherein

a liquid crystal is supported by being sandwiched between a pair of electrode substrates, each having a plurality of pixel regions formed two-dimensionally thereon,

each pixel region has at least one transmissive display region and at least one reflective display region,

the transmissive display region is, in at least one side thereof, adjacent to a transmissive display region of an adjacent pixel region without interposing the reflective display region therebetween,

the reflective display region is, in at least one side thereof, adjacent to a reflective display region of an adjacent pixel region without interposing the transmissive display region therebetween,

an inter-pixel region lying between the adjacent transmissive display regions and an inter-pixel region lying between the adjacent reflective display regions lie in a same straight line, and

a black matrix is formed above the linear inter-pixel regions lying between the adjacent transmissive display regions and lying between the adjacent reflective display regions, wherein

the black matrix is formed to have a multiple width in such a way that the black matrix has a larger width above the inter-pixel region lying between the adjacent transmissive display regions and has a smaller width above the inter-pixel region lying between the adjacent reflective display regions.

[2] A liquid crystal display device comprising:

a liquid crystal display panel wherein

a liquid crystal is supported by being sandwiched between a pair of electrode substrates, each having a plurality of pixel regions formed two-dimensionally thereon,

each pixel region has at least one transmissive display region and at least one reflective display region,

the transmissive display region is, in at least one side thereof, adjacent to a transmissive display region of an adjacent pixel region without interposing the reflective display region therebetween,

the reflective display region is, in at least one side thereof, adjacent to a reflective display region of an adjacent pixel region without interposing the transmissive display region therebetween,

an inter-pixel region lying between the adjacent transmissive display regions and an inter-pixel region lying between the adjacent reflective display regions lie in a same straight line, and

a black matrix is formed above the linear inter-pixel regions lying between the adjacent transmissive display regions and lying between the adjacent reflective display regions, wherein

the black matrix is formed only above the inter-pixel region lying between the adjacent transmissive display regions and is not formed above the inter-pixel region lying between the adjacent reflective display regions.

[3] The liquid crystal display device of claim 1 or 2, wherein

the pixel region, the transmissive display region, and the reflective display region are all

rectangular as seen in a plan view, and

the pixel region is divided into a plurality of regions, so that the transmissive display region and the reflective display region are arranged in the plurality of divided regions.

[4] The liquid crystal display device of claim 3, wherein

the pixel region is divided into two regions in an up/down or left/right direction, so that the transmissive display region and the reflective display region are arranged in the two divided regions.

[5] The liquid crystal display device of claim 3, wherein

the pixel region is divided into three regions in an up/down or left/right direction, so that the transmissive display region and the reflective display region are alternately arranged in the three divided regions.

[6] The liquid crystal display device of claim 3, wherein

the pixel region is divided into four regions in an up/down and left/right directions, so that the transmissive display region and the reflective display region are alternately arranged in the four divided regions.

[7] The liquid crystal display device of claim 1 or 2, wherein

a conductor portion formed between adjacent pixel regions in one electrode substrate of the pair of electrode substrates and at least one tapered region producing a height difference between the transmissive and reflective display regions, the tapered region being formed in another electrode substrate, which faces the one electrode substrate, are arranged to overlap

one another, as seen in a plan view.

[8] The liquid crystal display device of claim 1 or 2, wherein
the plurality of pixel regions are arranged in a matrix,
the pixel regions are provided one for each region surrounded by a scanning conductor
and a signal conductor, and
each pixel region includes
a transparent electrode formed in the transmissive display region,
a reflective electrode formed in the reflective display region, and
a transistor element that is formed near an intersection of the scanning conductor
and the signal conductor and drives the transparent electrode and the reflective electrode
according to a signal voltage fed from the signal conductor based on a scanning signal fed
from the scanning conductor.

[9] The liquid crystal display device of claim 8, wherein
the transistor element is covered with the reflective electrode.

[10] The liquid crystal display device of claim 8,
the black matrix is formed above the scanning conductor or/and the signal conductor so
as to overlap the scanning conductor or/and the signal conductor.

[11] The liquid crystal display device of claim 1 or 2, wherein
a width of the black matrix formed above the inter-pixel region lying between the
adjacent transmissive display regions is in a range from 10 μm to 30 μm , both ends inclusive.

[12] The liquid crystal display device of claim 1 or 2, wherein

a width of the black matrix formed above the inter-pixel region lying between the adjacent reflective display regions is in a range from 3 μm to 10 μm , both ends inclusive.

[13] The liquid crystal display device of claim 11, wherein

a width of the black matrix formed above the inter-pixel region lying between the adjacent reflective display regions is smaller than a width of the black matrix formed above the inter-pixel region lying between the adjacent transmissive display regions by, at each side, a predetermined dimension in a range from 1 μm to 15 μm , both ends inclusive.

[14] The liquid crystal display device of claim 11, wherein

a width of the black matrix formed above the inter-pixel region lying between the adjacent transmissive display regions is 18 μm , and a width of the black matrix formed above the inter-pixel region lying between the adjacent reflective display regions is 6 μm .